I 13 CONT.

68. (Amended) A method as in claim 73 wherein a said raster element comprises any one pixel.

REMARKS

This submission is in response to the Official Action dated August 17, 2001. A complete set of claims is included for convenience.

Applicant's attorney thanks the Examiner for his careful consideration and analysis of the Specification, drawings and claims.

Several changes have been made to the Specification. The two paragraphs added at page 20, line 10 in the amendment filed August 6, 2001 have been deleted, as requested.

Reference is made to Paragraph 4. on page 4 of the Office Action (referring to page 20, after line 10 of the Specification) in which the Examiner refers to a typographical error of the word "one". This error is contained in a paragraph which the Examiner has requested to be deleted, so it is not addressed.

Claims 48-68 are pending. Claims 51, 53, 54, 62, 64 and 66 have been cancelled, without prejudice. Claim 69 has been substituted for claim 51; claim 71 for claim 54; claim 70 for claim 62 and claim 73 for claim 66. All of the new claims have been written to comply with §112, and the existing claims amended to overcome the §112 rejection.

The following is a discussion of the drawings and the Examiner's

comments and objections thereto.

Fig. 1 – Fig. 1 of the priority document is inserted with reference number "8" changed to "7" to correspond to the Specification.

Fig. 2 – the presently pending substitute Fig. 2 appears to be correct and corresponds to page 13, lines 8-9 of the Specification. The "plates" are numbered 8. The transparent electrodes 10 are (vertically) "between the plates".

Fig. 3 – Please refer to the specification, page 14. The element 3 is a "light conductor", as mentioned by the Examiner. Reference numeral 7 refers to a light ray, or beam, as described with respect to Fig. 2. The Specification calls for "an acoustic-optical deflector 12" (right deflector has reference number 12, left deflector does not) that comprises (see left deflector) a piezoelectric element 14 shown on one end and a sound wave acceptor 15 on the other end. Referring to page 14, lines 18-24 - the light beam (enters from the left) on the light conductor 3. A deflector 12 is activated and the light beam received by the activated deflector is refracted by the sound waves (from 15) and "deflected" into a light conductor 3′ having a focusing cone 11.

The term "deflected" means that there must be some angular relationship between a deflector 12 and the light beam exiting into the associated light conductor 3′. The Examiner refers to a "curve". If he means the curved line at the junction of a light conductor 3′ with a deflector 12, then, if necessary and acceptable, this can be corrected by eliminating the "curve", i.e., making a straight line instead of a curve

line. But the "curve" of the line at the entrance to the light conductor 3' has no real significance. Therefore, it is respectfully submitted that Fig. 3 should be acceptable.

Fig. 4 – found to be acceptable.

Fig. 5(a) – an amended Fig. 5(a) is presented in which "A" has been changed to "(a)". The complimentary screen 1 has been added with the light rays 7. This corresponds to Fig. 5(b).

Fig. 5(b) – at page 19, line 4, "5" has been changed to "5(b)".

Fig. 6 – support for this is at page 15, line 24 to page 17, line 7 of the Specification.

Fig. 7 – please refer to page 20 of the Specification, beginning at the last paragraph for support. Several reference numbers are changed in the paragraph beginning at page 23, line 9 to also correspond to the drawing.

Fig. 8 – The Examiner refers to this in the Office Action but there was no Fig. 8 submitted as part of the Substitute Drawings on January 24, 2000 and there is no mention of Fig. 8 in the Specification. There was a Fig. 8 in the originally submitted incorrect set of drawings.

It is believed that the above should answer the Examiner's questions regarding the drawings.

The claims stand rejected under §112. No prior art has been applied. The claims are discussed below and questions raised by the Examiner are addressed.

In claims 48, 54, 57 and 66, the term "light splitter" or "beam splitter"

was used to define "an element to split (divide) light". In each of these claims, the term "light splitter" or "bean splitter" has been changed to "light dividing element". The Specification states that the BDS matrix comprises light dividing elements (see Specification, page 19, lines 17-21).

Referring to claim 52, the number of divided components corresponds to the number of lenses (page 20, lines 1-3). Thus, the term "one lens for each block of said P blocks" has been changed to "one lens for each of said P copies". Claim 52 also has been made dependent from claim 48.

Claim 62 has been cancelled and new independent claim 70 substituted. It should be noted that the method described refers to synthesizing of a 3D hologram using a 2D screen, rather than an object-reference beam (ORB) method used for transforming an image in a hologram. There is no way to form a 3D image from a 2D screen using and ORB technique.

Claim 54 has been cancelled and new dependent claims 71 and 72 substituted. Note that Fig. 1 presents a basic structure for the invention to be used in both image forming and recording (Specification page 8, lines 13-14), and includes a BDS as one of the elements. Page 16, lines 14-24 to page 17, lines 1-25 of the Specification describes an image plane to be used in a recording variant of the Fig. 1 device (another embodiment uses parallel scanning and another BDS construction - page 18, lines 1-4). Page 18, lines 17-25 to page 19, lines 1-3 describes a BDS for parallel scanning, and page 19, lines 4-16 describes using a BDS in recording device.

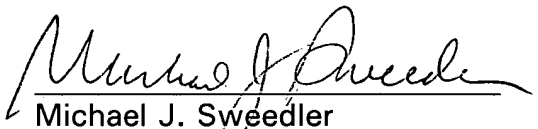
It is submitted that all of the new claims and the amended claims are fully supported in the Specification and satisfy §112.

In view of the above amendments and remarks, it is respectfully requested that the application be reconsidered and that all pending claims be allowed and the case passed to issue.

If there are any other issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

Prompt and favorable action is requested.

Respectfully submitted,



Michael J. Sweedler
Reg. No. 19,937
Attorney for Applicants

DARBY & DARBY, P.C.
805 Third Avenue
New York, N.Y. 10022
Phone (212) 527-7700

M:\0971\0D319\MOB8437.WPD

MARK-UP OF SPECIFICATION FOR AMENDMENT
PURSUANT TO 37 C.F.R. §1.121

Page 19, lines 4-16:

Fig. 5(b) illustrates an arrangement where all the constituent blocks of the image plane are all scanned together in parallel. Complimentary screen 1 this time forms a raster image (e.g., TV raster), so that each mirror deflects a corresponding part of the light emitted from screen 1 into the corresponding block of image plane 5 (each mirror corresponds to a block of an image plane). In the case of image recording mirrors can be placed directly behind the image plane associated, if necessary, with light focusing plate 30. In the case of image forming, there should be additionally used a space-time modulator - a matrix comprising an array of light modulators - placed between the image plane and the BDS matrix in order to independently modulate (gray scale, hue, etc.) the raster forming light in each block.

Page 23, lines 9-15

Laser [13] 31 produces coherent light [11] 27 and after diffraction on hologram plane 31, produces a three dimensional (3-D) image formed by diffracted light 32. The image may be viewed directly or projected onto a large screen by a

projection system. the use of three lasers, one for each color component, allows formation in the same way of a 3-D color image. As a holographic image restoring light may be also used that produced by mercury vapor lamp.

MARK-UP OF CLAIMS FOR AMENDMENT
PURSUANT TO 37 C.F.R. §1.121

48. (Amended) An image display system comprising:

(a) [A] at least one complimentary screen of one of light emitting or light source modulating devices in a two dimensional array of N (a real number) pixels, from which raster elements comprising one or pixels are [to be] sequentially generated;

(b) a raster multiplying system comprising [an array] a plurality of [mutually connected balanced lightsplitters] light dividing elements, each said [splitter] light dividing element to deflect a proportional part of [the array of N pixels] a raster element of the complimentary screen as a light beam and transmit the rest of said [array] beam to [next splitter,] another light dividing element to simultaneously form [P] copies of the generated raster elements, [of the complimentary screen, one copy for each of P blocks] with said copies of said raster elements to be used in forming P blocks, each block comprising a two dimensional array of pixels;

(c) an array of controllable modulators to simultaneously and independently modulate each of the raster elements for each of said P blocks, each said modulator having an output to coincide with a block of the image; and

(d) a surface on which an image with a resolution of M pixels is formed and displayed, comprised of said P blocks, [a said block comprising a two dimensional array of pixels,] where the number M exceeds the number N and where said components of (a), (b), (c), (d) are placed in the mentioned order of the light path of the complimentary screen.

49. (Not Amended) A system as in claim 48, comprising a plurality of modulators for each of said P blocks.

50. (Not Amended) A system as in claim 48, comprising a plurality of said complimentary screens.

Cancel claim 51 without prejudice and substitute therefor:

69. A 3D holographic image display system comprising:

(a) at least one complimentary screen of one of light emitting or light source modulating devices in a two array of N (a real number) pixels, from which raster elements comprising one or more pixels are sequentially generated;

(b) a raster multiplying system comprising a plurality of passive and at least partly light transmitting elements to simultaneously form copies of said generated raster elements of a complimentary screen, with said raster element copies forming P blocks with each block comprising a two dimensional array of pixels;

(c) an array of controllable modulators to simultaneously and independently modulate each of the raster elements for each of said P blocks, each modulator having an output to coincide with a block of the image;

(d) a surface on which a hologram comprised of said P blocks with a resolution of M pixels is formed, where the number M exceeds number N and where said components of (a), (b), (c) and (d) are placed in the mentioned order of the light path of the complimentary screen; and

(e) a holograph generator for producing a 3D holographic image from said hologram.

52. (Amended) A system as in claim [51] <u>48</u> wherein a lens raster matrix forms said raster multiplying system[, there being one lens for each block of said P blocks].

Cancel claim 53 without prejudice.

Cancel claim 54 without prejudice and substitute therefor:

71. A system as in claim 48 used for image recording further comprising:

(e) a photosensitive plane on which an outer image to be recorded is produced, said image presented comprising a plurality of said blocks, each block being of a two dimensional array of pixels, and all said blocks comprising M pixels, where number M exceeds number N, and where said system components of (a), (b) and (c) are placed in the mentioned order of the light path of the complimentary screen; and

(f) means to scan said plane information into electric signals for recording.

72. A system as in claim 71 wherein a lens raster matrix forms said raster multiplying system.

55. (Amended) A system as in claim [54] 71 further comprising a plurality of said complimentary screens.

56. (Amended) A system as in claim [54] 71 further comprising means for optic compression of generated raster elements for increasing the dot per inch resolution of a scanning light beam.

57. (Amended) A method for forming an image on an image display surface by [simultaneous] forming of P constituent blocks of said image, so that the image is presented as comprised of a plurality of blocks, a block having a two dimensional array of pixels, comprising the steps of:

(a) providing [a] at least one complimentary screen having a two dimensional array of N pixels [to generate an element of a raster for] from which raster elements of one or more pixels are sequentially generated with one or more of said raster elements to comprise a block of an image;

(b) using [an array] a raster multiplying system comprising a plurality of [balanced beam splitters] light dividing elements for partly transmitting and partly deflecting incoming light, each said light dividing element to separate a raster element corresponding one beam into a plurality of beam components to simultaneously form [P] copies of each said generated raster element [one coy for each of P blocks] with said copies of said raster elements forming P blocks, each block comprising a two dimensional array of pixels;

(c) transmitting the formed beam components to an array of controllable modulators to independently modulate the beam component corresponding to each raster element copy in accordance with control signals applied for each of said P blocks; and

(d) repeating the procedure successively generating other raster elements from said complimentary screen using the same[, beamsplitters] light

dividing elements to simultaneously form a modulated raster in each of P blocks; and

(e) displaying said P blocks on an image display plane in the form of an image[;]$_{\perp}$ said image having a resolution of M pixels, where M is greater than N.

58. (Not Amended) A method as in claim 57 further comprising the step of using a plurality of complimentary screens.

59. (Amended) A method as in claim 57 wherein a raster element comprises more than one pixel [and different raster elements overlap on said image display plane].

60. (Amended) A method as in claim 59, further comprising the step of subjecting a generated raster element[s] to additional optical compression for increasing dot per inch resolution of a sensitive plane scanning beam.

61. (Amended) A method as in claim 57 wherein a raster element is of the size of [a] only one pixel.

Cancel claim 62 without prejudice and substitute therefor:

70. A method for forming a hologram generated as a 3D holographic image by simultaneous forming of P constituent blocks of said hologram on an image display surface, so that the hologram is presented as comprised of a plurality of P blocks, a block having a two dimensional array of pixels, comprising the steps of:

(a) providing a complimentary screen having a two dimensional array of N pixels from which a plurality of raster elements of one or more pixels are generated with one or more of said generated raster elements to form a block of a hologram;

(b) using a raster multiplying system comprising an array of at least partly light transmitting elements to separate a raster element corresponding one beam into a plurality of beam components to simultaneously form a plurality of copies of a said generated raster element, with said generated copies of said raster element forming P blocks each block comprising a two dimensional array of pixels;

(c) transmitting the formed beam components to an array of controllable modulators, to independently modulate the beam component corresponding to each raster element copy in accordance with control signals applied for each of said P blocks;

(d) repeating the procedure successively generating other raster elements from said complimentary screen, to simultaneously form a modulated raster in each of said P blocks;

(e) placing said P blocks on an image display surface in the form of a hologram, said hologram having a resolution of M pixels, where M is greater than N; and

(f) generating a 3D holographic image from said hologram.

63. (Amended) A method as in claim [62] 57 comprising the use of lens raster matrix instead of [an array] said plurality of [balanced beam splitters] light dividing elements.

Cancel claim 64 without prejudice.

65. (Amended) A method for image forming as in claim [57] 70 used for producing a hard copy of an electrically formed holographic image, further comprising the step of:

generating a holographic image;

projecting the formed image on a photosensitive material;

forming a hologram on a photosensitive material; and

developing the photosensitive material.

Cancel claim 66 without prejudice and substitute therefor:

73. A method as in claim 57 used for image recording further comprising that the step of point (b) is followed by:

(f) converting the image information received on said plane by the projection of said beam components into P electric signals, one signal for one of said P blocks, for recording received information for P separate image elements; and

(g) repeating the procedure by successively generating other raster elements on said complimentary screen, to simultaneously scan each of P blocks.

74. A method as in claim 73 comprising the use of lens raster matrix as said raster multiplying system.

67. (Amended) A method as in claim [66] 73 wherein a raster element comprises a plurality of pixels [and different raster elements overlap on said image display plane].

68. (Amended) A method as in claim [66] 73 wherein a said raster element [is of the size of a] comprises any one pixel.